



STATEMENT OF BASIS
SPACE LAUNCH COMPLEX 41
SOLID WASTE MANAGEMENT UNIT NO. 47
45TH SPACE WING
CAPE CANAVERAL AIR FORCE STATION
BREVARD COUNTY, FLORIDA



PURPOSE OF STATEMENT OF BASIS

This Statement of Basis (SB) has been developed in order to inform the public and give the public an opportunity to comment on a proposed remedy to clean up contamination at Space Launch Complex 41 (SLC-41). A 45th Space Wing (45th SW) installation restoration partnering (IRP) team consisting of United States Air Force (USAF), United States Environmental Protection Agency (USEPA), the State of Florida Department of Environmental Protection (FDEP), the U. S. Army Corps of Engineers (USACOE), and various environmental consultants have determined that

Brief Site Description

SLC-41 encompasses approximately 60 acres and is located at the far northern end of CCAFS. The site was originally constructed in 1964 for the USAF Titan IIIc Missile Program. Currently, SLC-41 is under construction to support the Evolved Expendable Launch Vehicle program.

the proposed remedy is cost effective and protective of human health and the environment.

However, prior to implementation of the proposed remedy, the 45th SW IRP team would like to give an opportunity for the public to

comment on the proposed remedy. At any time during the public comment period, the public may comment as described in the "How Do You Participate" section of the SB. Upon closure of the public comment period, the 45th SW IRP team will evaluate all comments and issues raised in the comments and determine if there is a need to modify the proposed remedy prior to implementation.

WHY IS CLEANUP NEEDED?

The results of the Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) indicated that aroclors 1254 and 1260, two polychlorinated biphenyls (PCBs), a metal, and benzo(a)pyrene, a polynuclear aromatic hydrocarbon (PAH), are present in the surface soils at

levels that could be potentially harmful to human health if the site were used as residential setting. Additional information is provided in Table 1.

HOW DO YOU PARTICIPATE?

The 45th SW IRP team solicits public review and comment on this SB prior to implementation of the proposed remedy as a final remedy. The final remedy for SLC-41 will eventually be incorporated into the Hazardous and Solid Waste Amendments (HSWA) Permit for Cape Canaveral Air Force Station (CCAFS).

The Clean-up Remedy

The proposed clean-up remedy for Space Launch Complex 41 (SLC-41) includes (but is not limited to) the following components:

- Implementation of land use controls designed to prevent exposure to site contaminants. These include:
 - Prohibition of residential development
 - Quarterly monitoring requirements
 - Posting warning signs on-site

A complete list of land use controls and other protective measures are found in the SLC-41 Land Use Control Implementation Plan (LUCIP)

The public comment period for this SB and the

proposed remedy will begin on the date that a notice of the SB's availability is published in a major local newspaper of general circulation. The public comment period will end 45 days thereafter. If requested during the comment period, the 45th SW IRP team will hold a public meeting to respond to any oral comments or questions regarding the proposed remedy. To request a hearing or provide comments, contact the following person in writing within the 45-day comment period:

Mr. Jorge Caspary
FDEP-Bureau of Waste Cleanup
2600 Blair Stone Road, MS-4535
Tallahassee, FL 32399-2400
E-mail: Jorge.Caspary@dep.state.fl.us
Telephone: (850) 921-9986

The HSWA Permit, the SB, and the associated Administrative Record, including the RFI Report, will be available to the public for viewing and copying at:

Environmental Management, CEV/ESC
Facility 1638, Samuel Phillips Parkway
Cape Canaveral Air Force Station, FL
For public access call (321) 853-0965

This information can also be found on-line at
http://www.mission-support.org/45SW_IRP_EA

The HSWA Permit, the SB, and SLC-41 Report summaries will be available for viewing and copying at:

Central Brevard Library
308 Forrest Avenue
Cocoa, FL, 32922

To request further information, you may contact one of the following people:

Ms. Teresa Green
Environmental Restoration Element Chief
45 CES/CEVR
1224 Jupiter Street
Patrick Air Force Base, FL 32925-3343

E-mail: teresa.green@patrick.af.mil
Telephone: (321) 853-0965

Mr. Jorge Caspary
See previous contact information

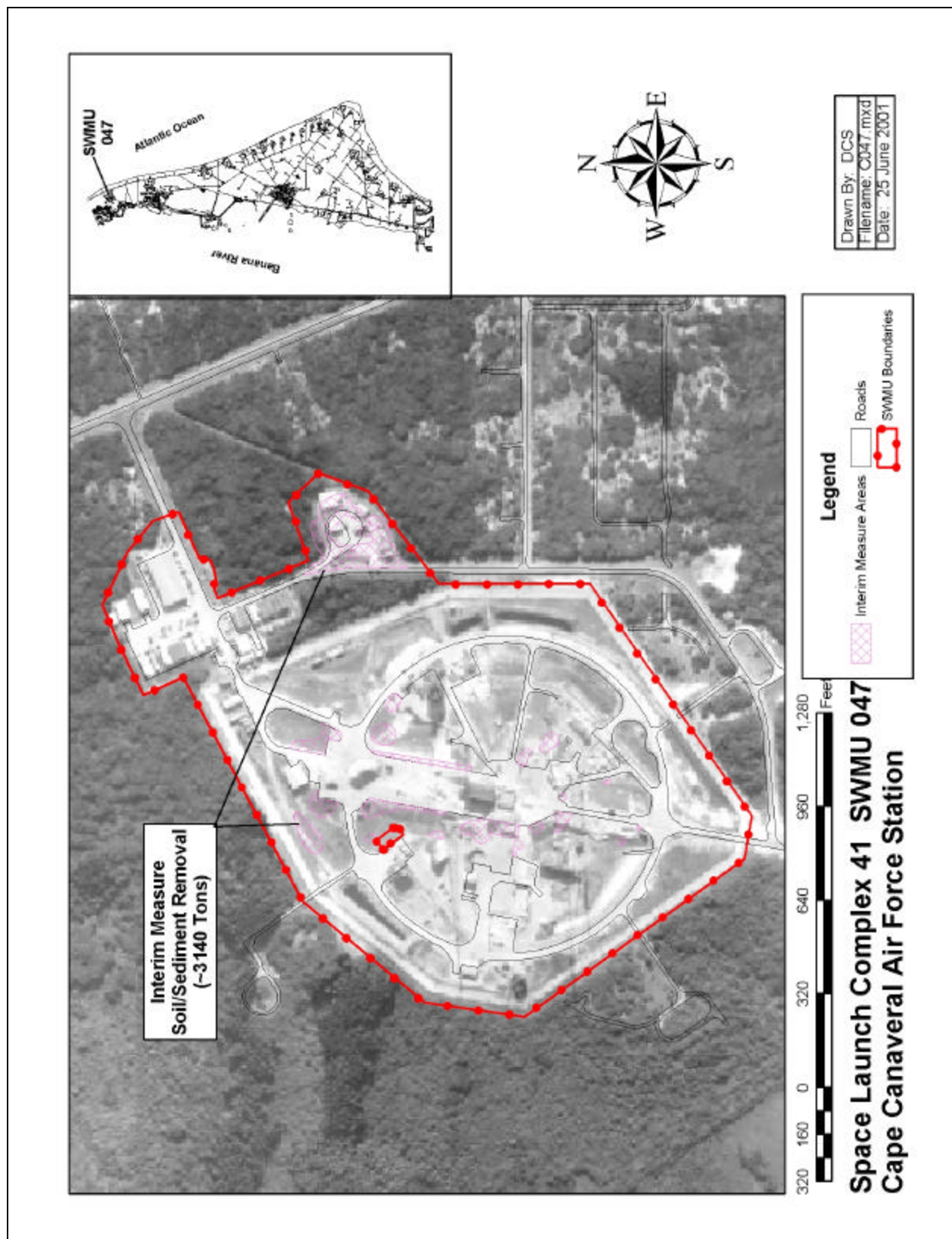
Mr. Timothy R. Woolheater, P. E.
EPA Federal Facilities Branch
Waste Management Division
Sam Nunn Atlanta Federal Center
61 Forsyth Street
Atlanta, GA 30303-8960
E-mail: woolheater.tim@epamail.epa.gov
Telephone: (404) 562-8510

FACILITY DESCRIPTION

USAF established the 45th SW as the primary organization for the Department of Defense aerospace force programs. Historically, the National Aeronautics and Space Administration (NASA) also performed space launch related operations on the 45th SW property. These operations have involved the use of toxic and hazardous materials. Under RCRA and the HSWA Permit (CCAFS Permit No. FL2800016121) issued by the and USEPA, the 45th SW was required to perform an investigation to determine the nature and extent of contamination from Solid Waste Management Unit (SWMU) No. 47, Space Launch Complex 41 (SLC-41).

SITE DESCRIPTION AND HISTORY

SLC-41 is approximately 60 acres and is located at the far northern end of CCAFS, occupying a strip of land that extends north into Kennedy Space Center property (See Figure 1). SLC-41 was originally constructed in 1964 for the USAF Titan IIIC Missile Program. The facility was refurbished from 1985 to 1988 for the Titan IV program. SLC-41 was officially dedicated in January 1988 as the first Titan IV launch facility, with the first Titan IV launch occurring in 1989. The Titan IV Program at SLC-41 terminated in 1999 and the facility was deactivated. The site is currently under



In accordance with RCRA Section 7004(b), this Statement of Basis summarizes the proposed remedy for CCAFS SLC-41. For detailed information, consult the SLC-41 RFI Report which is available for review at the 45th SW Environmental Management Office (See "How Do You Participate") or on-line at http://www.mission-support.org/45SW_IRP_EA.

construction to support the Evolved Expendable Launch Vehicle Program.

Historically, the Titan Rockets utilized liquid propellants, including hydrazine, nitrogen tetroxide, RP-1, and liquid oxygen. Solvents were used to flush rocket engine components. These and other hazardous materials were stored and used at various locations around SLC-41. During launch operations, thousands of gallons of water per minute were used to suppress vibrations and for cooling purposes. These “deluge” waters were collected in a concrete flumeway and basin before being released to the environment.

It is suspected that the launch stand and other site support structures were painted with coatings that contained PCBs. It is believed that the PCBs helped the paint withstand the extreme temperatures generated at launch time. Deluge basin discharge of potentially contaminated waters and dispersion of the paint chips that resulted from sandblasting operations are considered the primary causes of site contamination.

The USAF conducted the following investigations:

- 1990: A Preliminary Assessment including records search, site reconnaissance, and interviews with knowledgeable aerospace personnel identified 14 areas of concerns which warranted further investigation. A Site Investigation (SI) was recommended to collect and analyze the site's environmental media (soil, groundwater, surface water, and sediment) to evaluate the presence or absence of contamination.
- 1993-1994: The SI report concluded that the presence of constituents in soil, sediment, surface water, and groundwater might pose a risk to human health and the environment. The SI recommended that a RCRA Facility Investigation (RFI) be conducted to assess the nature and extent of the contamination present at the site, and

perform risk assessments to determine if the contamination is potentially detrimental to human or ecological health.

- 1998-1999: An Interim Measure (IM) was performed to remove PCB-contaminated soils. The clean-up action resulted in the removal of approximately 2,242 cubic yards (3,140 tons) of material. A site-specific risk-based clean-up level (18 mg/kg) was calculated, based on the facility's status as an active launch complex. Soils within the secure area of SLC-41 (inside the fence) were remediated to this level. Soils outside the fence were remediated to 2.0 mg/kg a level calculated to be protective of ecological receptors by the risk assessment
- 1995-2000: An RFI was performed, detailing the sampling and analysis of soil, sediment, surface water, and groundwater. These results were used to determine human health and ecological risks. The Human Health Risk Assessment (HHRA) indicated that site soils may pose a potential risk. The Ecological Risk Assessment (ERA) indicated that no unacceptable ecological risk is present at the site.

SUMMARY OF SITE RISK

As part of the RFI activities, an HHRA and an ERA were conducted to estimate the health and environmental risks associated with the site-specific contamination. The risk assessments were performed in accordance with risk management decision processes established by the USEPA, FDEP, and the USAF at the time the RFI was initiated.

The Chemicals of Concern (COCs) identified for human health during the RFI were:

- Soil: aroclor 1254, aroclor 1260, arsenic, and benzo(a)pyrene

Groundwater contaminants did not exceed Maximum Contaminant Levels (MCLs)

established by USEPA and were therefore not carried forward as COCs in the risk assessment. Surface water and sediment occur at the site intermittently and are not hydraulically connected to the Banana River. Therefore, the HHRA determined that there is no viable exposure pathway to human receptors from these media.

Soil was therefore the only medium that demonstrated a potential unacceptable human health risk. A soil removal was performed based on initial RFI data. This removal targeted all areas where soil posed a potential risk under current and future worker scenarios. Remaining soils continue to pose a potentially unacceptable risk only under the hypothetical future adult and child resident scenarios, for which both the one in one million (1/1,000,000) cancer threshold and the noncarcinogenic hazard index target of 1.0 are exceeded. Aroclor 1254, aroclor 1260, arsenic, and benzo (a)pyrene were the primary contributors to remaining cancer risk, while arsenic was the most significant contributor to the remaining noncarcinogenic hazard.

The ERA was conducted to evaluate the possibility that land and aquatic organisms (eco-receptors) may be at risk from site-related contaminants. The ERA was based on laboratory analyses of soil samples. Ground-water was not evaluated in the ERA, as there is no identified exposure pathway.

The ERA concluded that potential risk from the exposure to and/or ingestion of soil by eco-receptors is marginal. Several factors mitigate the potential concern. These could include routine facility operation and maintenance activities, less than optimal habitat found within facility boundaries, and the extent of the eco-receptor's normal foraging area.

WHAT ARE THE CLEANUP OBJECTIVES AND LEVELS?

The remedial action objective (RAO) is to protect humans from exposure to soils by

preventing residential land use where site contaminant concentrations are higher than regulatory standards. Table 1 list the COCs present at SLC-41. The first column lists the chemical name, the second column lists the maximum concentration detected in the impacted medium at SLC-41 during the RFI, and the last column presents the clean-up level to be achieved at the site.

TABLE 1—CLEANUP GOALS

Site-Related Chemicals of Concern (COCs) ¹	Maximum Detected Concentration (mg/kg)	Site-Specific Clean-up Level ² (mg/kg)
SOIL		
Aroclor 1254	17	0.5
Aroclor 1260	20	0.5
Arsenic	6.2	0.8
Benzo(a)pyrene	0.28	0.1

¹ Note that residual COCs are located within the controlled area of SLC-41, not in the peripheral sandblast area located outside the fence

² Clean-up level represents the most stringent value among USEPA and FDEP criteria at the time of the final investigation.

CLEANUP ALTERNATIVES FOR SLC-41

Clean-up alternatives are different combinations of plans to restrict site use and to contain, remove, and/or treat contamination in order to protect public health and the environment. Only two alternatives were considered because of low levels of contamination present at SLC-41. The clean-up alternatives considered for SLC-41 are summarized below.

No Action: Evaluation of the No-Action alternative is used as a basis for comparison with other alternatives. Under this alternative, no remedial action would be taken to reduce human health risks or restrict site use. It was determined this alternative would not attain the RAO.

Land Use Controls: Under this alternative, the base would implement site-specific land use controls to protect against exposure to contaminated soils at SLC-41. The 45th SW, USEPA, and FDEP have entered into a Memorandum of Agreement (MOA), which outlines how land use controls will be managed at the 45th SW. The MOA requires periodic inspections, warning signs, condition certification, construction project coordination, and agency notification. Site-specific details can be found in the SLC-41 Land Use Control Implementation Plan (LUCIP).

EVALUATION OF REMEDY ALTERNATIVES

Each cleanup alternative was evaluated to determine how each potential remedy would comply with the four general standards for corrective measures. The four general standards for corrective measures are:

- Overall protection of human health and the environment;
- Attain media cleanup standards;
- Control the sources of releases; and
- Comply with standards for management of wastes

The second alternative (Land Use Controls) meets each of the above criteria, while the no action alternative remedy would not meet them.

LAND USE CONTROLS AGREEMENT

By separate MOA dated 23 December 1999, with USEPA and FDEP, CCAFS, on behalf of the Department of the Air Force, agreed to implement base-wide, certain periodic site inspection, condition certification, and agency notification procedures designed to ensure the maintenance by installation personnel of any site-specific land use controls deemed necessary for future protection of human health and the environment. A fundamental premise underlying execution of that agreement was that through the USAF's substantial good-faith compliance with the procedures called for

therein, reasonable assurances would be provided to the USEPA and FDEP as to the permanency of those remedies which included the use specific land use controls.

Although the terms and conditions of the MOA are not specifically incorporated or made enforceable herein by reference, it is understood and agreed by the USAF, USEPA, and FDEP that the contemplated permanence of the remedy reflected herein shall be dependent on CCAFS's substantial good-faith compliance with the specific land use control maintenance commitments reflected therein. Should such compliance not occur or should the MOA be terminated, it is understood that the protectiveness of the remedy concurred in may be reconsidered and that additional measures may need to be taken to adequately ensure necessary future protection of human health and the environment.

WHAT IMPACTS WOULD THE CLEANUP HAVE ON THE LOCAL COMMUNITY?

There would be no impacts to the local community because residential use of SLC-41 is not occurring nor is it expected in the near future. As long as CCAFS remains an active gateway for the aerospace industry, SLC-41 is expected to continue operating in an industrial capacity.

WHY DOES THE 45th SW IRP TEAM RECOMMEND THIS REMEDY?

The 45th IRP team recommends the proposed remedy because it will provide sufficient and cost effective safeguards for residential exposures scenarios. Additionally, it will maintain an environment consistent with current usage so there is no significant increase for potential exposure to ecological receptors. The proposed remedy meets the four general standards for corrective measures.

NEXT STEPS

The 45th SW IRP team will review all comments on this SB to determine if the proposed remedy needs modification prior to implementation and prior to incorporating the proposed remedy into the CCAFS HSWA permit. If the proposed remedy is determined to be appropriate for implementation, then land use controls will be initiated and a LUCIP will be developed and incorporated into the MOA.



LAND USE CONTROL IMPLEMENTATION PLAN

SPACE LAUNCH COMPLEX 41 SOLID WASTE MANAGEMENT UNIT 47 (SWMU NO. 47) 45TH SPACE WING CAPE CANAVERAL AIR FORCE STATION BREVARD COUNTY, FLORIDA

Facility Description

Space Launch Complex 41 (SLC-41), Solid Waste Management Unit 47 (SWMU No. 47), was constructed in 1964 for the United States Air Force (USAF) Titan IIIC Missile Program. After completion of the Titan/Centaur launches in 1977, SLC-41 was deactivated, with the exception of the Propellant Temperature Control Units. Renovation and modification of SLC-41 was proposed in 1986 to support the USAF Complementary Expendable Launch Vehicle program. SLC-41 was refurbished from 1985 to 1988 to upgrade the complex to a Titan IV configuration. SLC-41 was officially dedicated in January 1988 as the first Titan IV launch facility and the first launch occurred in June 1989. The Titan IV program at SLC-41 terminated in 1999 and the site is currently under construction to support the Evolved Expendable Launch Vehicle (EELV) program.

Location

(Reference Site Map on last page of this document)

Site Plan Coordinate	Northing	Easting
North	1546444.49	790693.90
West	1544999.56	789291.56
South	1544222.47	789975.60
East	1545704.60	791143.60

Objective

Implementation of site-specific land use controls to prevent exposure of hypothetical future residents to the soil.

Land Use Controls (LUCs) to be Implemented:

Administrative:

- The property will be prohibited from residential or other non-industrial development without prior written notification to the Florida Department of Environmental Protection (FDEP) and the United States Environmental Protection Agency (USEPA) concerning the SWMU land use change. Dependent on site conditions and the nature

LUCIP
SPACE LAUNCH COMPLEX 41 (SWMU NO. 47)
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and intensity of the proposed land use change, additional site investigations and assessments could be required for the USAF. Based on these analyses, additional remedial measures may be required prior to land use change.

- Perform and document baseline LUC audit upon finalization of the Statement of Basis.
- Perform and document quarterly LUC compliance inspections in accordance with 45th SW LUC Operations Manual.
- Perform, document, and report an annual audit on LUC implementation, maintenance, and compliance in accordance with the 45th SW LUC Operations Manual and the current CCAFS Corrective Action Management Plan (CAMP).
- The property Land Use Control Implementation Plan (LUCIP) shall remain in effect until:
 - a) Changes to applicable Federal and State risk-based clean-up standards occur which indicate site contaminants no longer pose potential residential risk; or
 - b) Reduction in site contaminant concentrations to below Federal and State residential risk-based clean-up standards occurs.
- In the event of property realignment, transfer, or re-use for non-industrial or non-commercial purposes, assessment and remediation may be necessary to ensure that impacts to ecological receptors are not increased or to mitigate potential ecological impacts where residual contamination exists.

Soil:

- Soils will not be disturbed or moved during property development, maintenance or construction, without:
 - a) USAF review, coordination, and approval of the proposed construction/development plans via AF Form 103 (Base Civil Engineer Work Clearance Request), 332 (Base Civil Engineer Work Request), 813 (Request for Environmental Impact Analysis), or similar process;
 - b) Ensuring proper engineering controls are in-place so that unauthorized release or disposal of the affected media does not occur. This includes conducting appropriate testing and developing a disposal plan in accordance with the LUC Operations Manual prior to off-site disposal; and
 - c) Use of proper personal protection equipment by site workers, as determined by the project proponent's occupational health and safety advisor.
- The site will be posted with proper warning signs in accordance with the LUC Operations Manual and the CCAFS Hazardous and Solid Waste Amendments (HSWA) Permit.
- The site shall be maintained relative to its current ecological habitat in order to minimize contact by ecological receptors.

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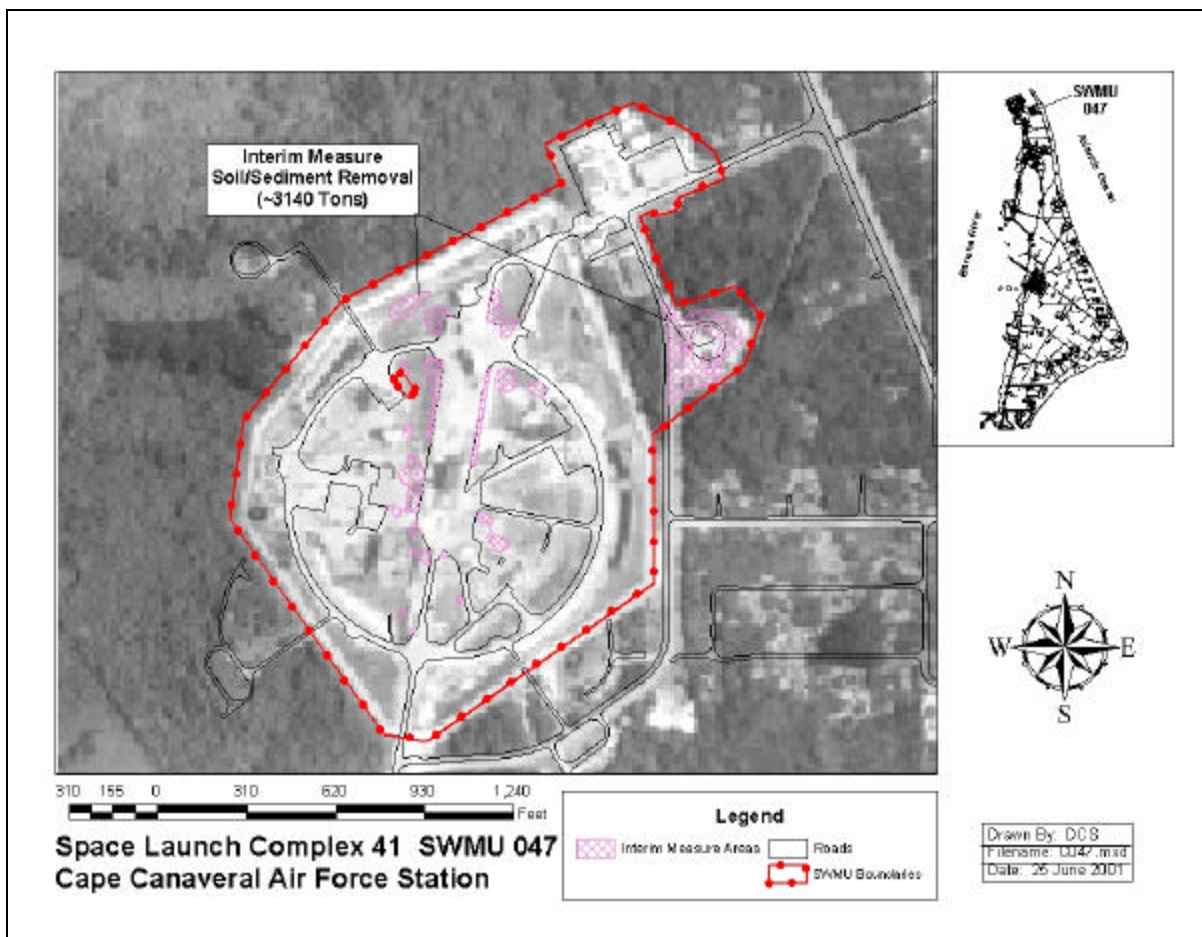
The Statement of Basis (SB) is currently being reviewed. It is anticipated that the SB will be accepted/incorporated into the HSWA Permit, scheduled for issuance early in 2002.

Additional Information:

Pertinent Document Reference:

RCRA Facility Investigation, Space Launch Complex 41, SWMU No. 47, BEM Systems, Inc., January 2000.

Space Launch Complex 41 – Site Map



Please contact the 45 SW Installation Restoration Program Office to obtain additional information, including: the 45 SW Land Use Controls Operation Plan; the CCAFS HSWA Permit; a complete record of corrective actions at SLC-41; or other related documents, guidance, and regulations. The IRP office can be reached by phone at (321) 853-0965. Information can also be obtained via the IRP website at http://www.mission-support.org/45SW_IRP_EA